

## SIGNAL PROCESSING APPARATUS AND METHOD

### Abstract of the Invention

5 A signal processor which acquires a first signal, including a first desired signal portion and a first undesired signal portion, and a second signal, including a second desired signal portion and a second undesired signal portion, wherein the first and second desired signal portions are correlated. The signals may be acquired by propagating energy through a medium and measuring an attenuated signal after transmission or reflection. Alternatively, the signals may be acquired by measuring energy generated by the medium. A processor of the present invention generates a noise  
10 reference signal which is a combination of only the undesired signal portions and is correlated to both the first and second undesired signal portions. The noise reference signal is then used to remove the undesired portion of each of the first and second measured signals via an adaptive noise canceler, preferably of the joint process estimator type. The processor of the present invention may be employed in conjunction  
15 with an adaptive noise canceler in physiological monitors wherein the known properties of energy attenuation through a medium are used to determine physiological characteristics of the medium. Many physiological conditions, such as the pulse of a patient or the concentration of a constituent in a medium, can be determined from the desired portion of the signal after undesired signal portions, such as those caused by  
20 erratic motion, are removed.

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